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NOTICE OF ALLOWANCE AND FEE(S) DUE

31366 7590 12/05/2008

HORIZON IP PTE LTD
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SINGAPORE 199591,
SINGAPORE

EXAMINER

HUYNH, PHUONG

ART UNIT

PAPER NUMBER

2857

DATE MAILED: 12/05/2008

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
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10/622,247

07/18/2003

Sheldon C. P. Lim

CS01-150

3131

TITLE OF INVENTION: METHOD FOR DETECTING AND MONITORING DEFECTS

APPLN. TYPE	SMALL ENTITY	ISSUE FEE DUE	PUBLICATION FEE DUE	PREV. PAID ISSUE FEE	TOTAL FEE(S) DUE	DATE DUE
nonprovisional	NO	\$1510	\$300	\$0	\$1810	03/05/2009

THE APPLICATION IDENTIFIED ABOVE HAS BEEN EXAMINED AND IS ALLOWED FOR ISSUANCE AS A PATENT. PROSECUTION ON THE MERITS IS CLOSED. THIS NOTICE OF ALLOWANCE IS NOT A GRANT OF PATENT RIGHTS. THIS APPLICATION IS SUBJECT TO WITHDRAWAL FROM ISSUE AT THE INITIATIVE OF THE OFFICE OR UPON PETITION BY THE APPLICANT. SEE 37 CFR 1.313 AND MPEP 1308.

THE ISSUE FEE AND PUBLICATION FEE (IF REQUIRED) MUST BE PAID WITHIN THREE MONTHS FROM THE MAILING DATE OF THIS NOTICE OR THIS APPLICATION SHALL BE REGARDED AS ABANDONED. THIS STATUTORY PERIOD CANNOT BE EXTENDED. SEE 35 U.S.C. 151. THE ISSUE FEE DUE INDICATED ABOVE DOES NOT REFLECT A CREDIT FOR ANY PREVIOUSLY PAID ISSUE FEE IN THIS APPLICATION. IF AN ISSUE FEE HAS PREVIOUSLY BEEN PAID IN THIS APPLICATION (AS SHOWN ABOVE), THE RETURN OF PART B OF THIS FORM WILL BE CONSIDERED A REQUEST TO REAPPLY THE PREVIOUSLY PAID ISSUE FEE TOWARD THE ISSUE FEE NOW DUE.

HOW TO REPLY TO THIS NOTICE:

I. Review the SMALL ENTITY status shown above.

If the SMALL ENTITY is shown as YES, verify your current SMALL ENTITY status:

A. If the status is the same, pay the TOTAL FEE(S) DUE shown above.

B. If the status above is to be removed, check box 5b on Part B - Fee(s) Transmittal and pay the PUBLICATION FEE (if required) and twice the amount of the ISSUE FEE shown above, or

If the SMALL ENTITY is shown as NO:

A. Pay TOTAL FEE(S) DUE shown above, or

B. If applicant claimed SMALL ENTITY status before, or is now claiming SMALL ENTITY status, check box 5a on Part B - Fee(s) Transmittal and pay the PUBLICATION FEE (if required) and 1/2 the ISSUE FEE shown above.

II. PART B - FEE(S) TRANSMITTAL, or its equivalent, must be completed and returned to the United States Patent and Trademark Office (USPTO) with your ISSUE FEE and PUBLICATION FEE (if required). If you are charging the fee(s) to your deposit account, section "4b" of Part B - Fee(s) Transmittal should be completed and an extra copy of the form should be submitted. If an equivalent of Part B is filed, a request to reapply a previously paid issue fee must be clearly made, and delays in processing may occur due to the difficulty in recognizing the paper as an equivalent of Part B.

III. All communications regarding this application must give the application number. Please direct all communications prior to issuance to Mail Stop ISSUE FEE unless advised to the contrary.

IMPORTANT REMINDER: Utility patents issuing on applications filed on or after Dec. 12, 1980 may require payment of maintenance fees. It is patentee's responsibility to ensure timely payment of maintenance fees when due.

PART B - FEE(S) TRANSMITTAL

**Complete and send this form, together with applicable fee(s), to: Mail Mail Stop ISSUE FEE
Commissioner for Patents
P.O. Box 1450
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or Fax (571)-273-2885**

INSTRUCTIONS: This form should be used for transmitting the ISSUE FEE and PUBLICATION FEE (if required). Blocks 1 through 5 should be completed where appropriate. All further correspondence including the Patent, advance orders and notification of maintenance fees will be mailed to the current correspondence address as indicated unless corrected below or directed otherwise in Block 1, by (a) specifying a new correspondence address; and/or (b) indicating a separate "FEE ADDRESS" for maintenance fee notifications.

CURRENT CORRESPONDENCE ADDRESS (Note: Use Block 1 for any change of address)

Note: A certificate of mailing can only be used for domestic mailings of the Fee(s) Transmittal. This certificate cannot be used for any other accompanying papers. Each additional paper, such as an assignment or formal drawing, must have its own certificate of mailing or transmission.

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#04-306/308 The Plaza
SINGAPORE 199591,
SINGAPORE

Certificate of Mailing or Transmission

I hereby certify that this Fee(s) Transmittal is being deposited with the United States Postal Service with sufficient postage for first class mail in an envelope addressed to the Mail Stop ISSUE FEE address above, or being facsimile transmitted to the USPTO (571) 273-2885, on the date indicated below.

(Depositor's name)
(Signature)
(Date)

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
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10/622,247 07/18/2003 Sheldon C. P. Lim CS01-150 3131

TITLE OF INVENTION: METHOD FOR DETECTING AND MONITORING DEFECTS

APPLN. TYPE	SMALL ENTITY	ISSUE FEE DUE	PUBLICATION FEE DUE	PREV. PAID ISSUE FEE	TOTAL FEE(S) DUE	DATE DUE
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nonprovisional NO \$1510 \$300 \$0 \$1810 03/05/2009

EXAMINER	ART UNIT	CLASS-SUBCLASS
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HUYNH, PHUONG 2857 702-179000

1. Change of correspondence address or indication of "Fee Address" (37 CFR 1.363).

- ☐ Change of correspondence address (or Change of Correspondence Address form PTO/SB/122) attached.
- ☐ "Fee Address" indication (or "Fee Address" Indication form PTO/SB/47; Rev 03-02 or more recent) attached. **Use of a Customer Number is required.**

2. For printing on the patent front page, list

- (1) the names of up to 3 registered patent attorneys or agents OR, alternatively, 1 _____
- (2) the name of a single firm (having as a member a registered attorney or agent) and the names of up to 2 registered patent attorneys or agents. If no name is listed, no name will be printed. 2 _____
- 3 _____

3. ASSIGNEE NAME AND RESIDENCE DATA TO BE PRINTED ON THE PATENT (print or type)

PLEASE NOTE: Unless an assignee is identified below, no assignee data will appear on the patent. If an assignee is identified below, the document has been filed for recordation as set forth in 37 CFR 3.11. Completion of this form is NOT a substitute for filing an assignment.

(A) NAME OF ASSIGNEE (B) RESIDENCE: (CITY and STATE OR COUNTRY)

Please check the appropriate assignee category or categories (will not be printed on the patent) : ☐ Individual ☐ Corporation or other private group entity ☐ Government

4a. The following fee(s) are submitted:

- ☐ Issue Fee
- ☐ Publication Fee (No small entity discount permitted)
- ☐ Advance Order - # of Copies _____

4b. Payment of Fee(s); (Please first reapply any previously paid issue fee shown above)

- ☐ A check is enclosed.
- ☐ Payment by credit card. Form PTO-2038 is attached.
- ☐ The Director is hereby authorized to charge the required fee(s), any deficiency, or credit any overpayment, to Deposit Account Number _____ (enclose an extra copy of this form).

5. Change in Entity Status (from status indicated above)

- ☐ a. Applicant claims SMALL ENTITY status. See 37 CFR 1.27. ☐ b. Applicant is no longer claiming SMALL ENTITY status. See 37 CFR 1.27(g)(2).

NOTE: The Issue Fee and Publication Fee (if required) will not be accepted from anyone other than the applicant; a registered attorney or agent; or the assignee or other party in interest as shown by the records of the United States Patent and Trademark Office.

Authorized Signature _____

Date _____

Typed or printed name _____

Registration No. _____

This collection of information is required by 37 CFR 1.311. The information is required to obtain or retain a benefit by the public which is to file (and by the USPTO to process) an application. Confidentiality is governed by 35 U.S.C. 122 and 37 CFR 1.14. This collection is estimated to take 12 minutes to complete, including gathering, preparing, and submitting the completed application form to the USPTO. Time will vary depending upon the individual case. Any comments on the amount of time you require to complete this form and/or suggestions for reducing this burden, should be sent to the Chief Information Officer, U.S. Patent and Trademark Office, U.S. Department of Commerce, P.O. Box 1450, Alexandria, Virginia 22313-1450. DO NOT SEND FEES OR COMPLETED FORMS TO THIS ADDRESS. SEND TO: Commissioner for Patents, P.O. Box 1450, Alexandria, Virginia 22313-1450.

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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/622,247	07/18/2003	Sheldon C. P. Lim	CS01-150	3131
31366	7590	12/05/2008	EXAMINER	
HORIZON IP PTE LTD 7500A Beach Road #04-306/308 The Plaza SINGAPORE 199591, SINGAPORE			HUYNH, PHUONG	
			ART UNIT	PAPER NUMBER
			2857	
			DATE MAILED: 12/05/2008	

Determination of Patent Term Adjustment under 35 U.S.C. 154 (b) (application filed on or after May 29, 2000)

The Patent Term Adjustment to date is 194 day(s). If the issue fee is paid on the date that is three months after the mailing date of this notice and the patent issues on the Tuesday before the date that is 28 weeks (six and a half months) after the mailing date of this notice, the Patent Term Adjustment will be 194 day(s).

If a Continued Prosecution Application (CPA) was filed in the above-identified application, the filing date that determines Patent Term Adjustment is the filing date of the most recent CPA.

Applicant will be able to obtain more detailed information by accessing the Patent Application Information Retrieval (PAIR) WEB site (<http://pair.uspto.gov>).

Any questions regarding the Patent Term Extension or Adjustment determination should be directed to the Office of Patent Legal Administration at (571)-272-7702. Questions relating to issue and publication fee payments should be directed to the Customer Service Center of the Office of Patent Publication at 1-(888)-786-0101 or (571)-272-4200.

Notice of Allowability	Application No.	Applicant(s)	
	10/622,247	LIM, SHELDON C. P.	
	Examiner	Art Unit	
	PHUONG HUYNH	2857	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address--

All claims being allowable, PROSECUTION ON THE MERITS IS (OR REMAINS) CLOSED in this application. If not included herewith (or previously mailed), a Notice of Allowance (PTOL-85) or other appropriate communication will be mailed in due course. **THIS NOTICE OF ALLOWABILITY IS NOT A GRANT OF PATENT RIGHTS.** This application is subject to withdrawal from issue at the initiative of the Office or upon petition by the applicant. See 37 CFR 1.313 and MPEP 1308.

1. ☒ This communication is responsive to RCE filed on 10/13/2008.
2. ☒ The allowed claim(s) is/are 1-10, 12-23, 25, 26, 30, 33, and 35-40.
3. ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
 - a) ☐ All b) ☐ Some* c) ☐ None of the:
 1. ☐ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. _____.
 3. ☐ Copies of the certified copies of the priority documents have been received in this national stage application from the International Bureau (PCT Rule 17.2(a)).
 - * Certified copies not received: _____.

Applicant has THREE MONTHS FROM THE "MAILING DATE" of this communication to file a reply complying with the requirements noted below. Failure to timely comply will result in ABANDONMENT of this application.

THIS THREE-MONTH PERIOD IS NOT EXTENDABLE.

4. ☐ A SUBSTITUTE OATH OR DECLARATION must be submitted. Note the attached EXAMINER'S AMENDMENT or NOTICE OF INFORMAL PATENT APPLICATION (PTO-152) which gives reason(s) why the oath or declaration is deficient.
5. ☐ CORRECTED DRAWINGS (as "replacement sheets") must be submitted.
 - (a) ☐ including changes required by the Notice of Draftsperson's Patent Drawing Review (PTO-948) attached
 - 1) ☐ hereto or 2) ☐ to Paper No./Mail Date _____.
 - (b) ☐ including changes required by the attached Examiner's Amendment / Comment or in the Office action of Paper No./Mail Date _____.

Identifying indicia such as the application number (see 37 CFR 1.84(c)) should be written on the drawings in the front (not the back) of each sheet. Replacement sheet(s) should be labeled as such in the header according to 37 CFR 1.121(d).
6. ☐ DEPOSIT OF and/or INFORMATION about the deposit of BIOLOGICAL MATERIAL must be submitted. Note the attached Examiner's comment regarding REQUIREMENT FOR THE DEPOSIT OF BIOLOGICAL MATERIAL.

Attachment(s)

- | | |
|---|---|
| <ol style="list-style-type: none"> 1. <input type="checkbox"/> Notice of References Cited (PTO-892) 2. <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) 3. <input type="checkbox"/> Information Disclosure Statements (PTO/SB/08),
Paper No./Mail Date _____ 4. <input type="checkbox"/> Examiner's Comment Regarding Requirement for Deposit
of Biological Material | <ol style="list-style-type: none"> 5. <input type="checkbox"/> Notice of Informal Patent Application 6. <input type="checkbox"/> Interview Summary (PTO-413),
Paper No./Mail Date _____. 7. <input checked="" type="checkbox"/> Examiner's Amendment/Comment 8. <input checked="" type="checkbox"/> Examiner's Statement of Reasons for Allowance 9. <input type="checkbox"/> Other _____. |
|---|---|

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DETAILED ACTION

Continued Examination Under 37 CFR 1.114

1. A request for continued examination under 37 CFR 1.114, including the fee set forth in 37 CFR 1.17(e), was filed in this application after final rejection. Since this application is eligible for continued examination under 37 CFR 1.114, and the fee set forth in 37 CFR 1.17(e) has been timely paid, the finality of the previous Office action has been withdrawn pursuant to 37 CFR 1.114. Applicant's submission filed on 10/13/2008 has been entered.

EXAMINER'S AMENDMENT

2. An examiner's amendment to the record appears below. Should the changes and/or additions be unacceptable to applicant, an amendment may be filed as provided by 37 CFR 1.312. To ensure consideration of such an amendment, it **MUST** be submitted no later than the payment of the issue fee.

The application has been amended as follows:

IN THE CLAIMS:

Claim 7, line 13, replace "L1/Ri" by --Li/Ri--

(this change is to correct a typographical error that needs to be fixed to be consistent with earlier claimed "effective lengths (L1, L2, ...Li)" as recited at line 9).

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Claim 35, line 7, replace "portion" by --portions--

(this change is to correct a typographical error that needs to be fixed to be consistent with earlier claimed "portions" as recited at lines 3 and 4).

Allowable Subject Matter

3. **Claims 1-10, 12-23, 25, 26, 30, 33, and 35-40** are allowed.
4. The following is an examiner's statement of reasons for allowance:

Borden et al. (hereinafter "Borden") (USPN. 6,049,220) discloses an apparatus and method uses diffusive modulation (without generating a wave of carriers) for measuring a material property (such as any one or more of: mobility, doping, and lifetime) that is used in evaluating a semiconductor wafer. The measurements are carried out in a small area, for use on wafers having patterns for integrated circuit dice. The measurements are based on measurement of reflectance, for example as a function of carrier concentration. In one implementation, the semiconductor wafer is illuminated with two beams, one with photon energy above the bandgap energy of the semiconductor, and another with photon energy near or below the bandgap. The diameters of the two beams relative to one another are varied to extract additional information about the semiconductor material, for use in measuring, e.g. lifetime [see Borden: Abstract; col. 8, line 61-col. 19, line 21; col. 20, line50-col. 21, line 4; col. 8, lines 12-32].

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Akram et al. (hereinafter "Akram") (USPN. 6,022,750) discloses an interconnect for a semiconductor die includes integrally formed test structures for evaluating various electrical characteristics of the interconnect. The test structures can include Kelvin structures, van der Pauw structures, resistors, capacitors, contact chains, via chains, serpentine test structures, and antenna test structures. Among the electrical characteristics that can be evaluated are the resistivity of contact member, conductor and substrate components of the interconnect, contact resistance between the contact members and conductors and capacitance of the contact members and conductors with respect to the substrate [see Akram: Abstract; col. 2, lines 2-17; col. 5, lines 1-17; and col. 6, lines 1-22].

Peng et al. (hereinafter "Peng") (USPN. 5,787,190) discloses an automated system and procedure processes wafer test bin data of semiconductor wafers to formulate a fault pattern at statistically significant levels. A processor such as a neural engine or neural network collects wafer test bin results to generate a N/N wafer map to be correlated with wafer maps produced from a wafer electrical test, a wafer level reliability test, and an in-line defect analysis. A N/N wafer map generated by the processor is cross-checked with a wafer map generated from another semiconductor tester to formulate possible overlap fault patterns. The confirmed fault patterns are further analyzed by performing failure analysis to find the root cause of fault patterns. A report containing fault patterns and the root cause for fault patterns is sent back to a fab for making adjustment to the fabrication process to increase the overall yield of the

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future batch of semiconductor wafers. The report is also stored in a pattern database to serve as a library for future reference of previously recognized fault patterns, thereby to bypass the need to perform a failure analysis for matching fault patterns [see Peng: Abstract; col. 3, lines 31-60].

Takekoshi et al. (hereinafter "Takekoshi") (USPN. 7,091,733) discloses a reliability evaluation test apparatus of this invention includes a wafer storage section which stores a wafer in a state wherein the electrode pads of a number of devices formed on the wafer and the bumps of a contactor are totally in electrical contact with each other. The wafer storage section transmits/receives a test signal to/from a measurement section and has a hermetic and heat insulating structure. The wafer storage section has a pressure mechanism which presses the contactor and a heating mechanism which directly heats the wafer totally in contact with the contactor to a predetermined high temperature. The reliability of an interconnection film and insulating film formed on the semiconductor wafer are evaluated under an accelerated condition [see Takekoshi: Abstract; col. 9, lines 10-25; col. 15, lines 14-30, lines 30-39].

Regarding claim 1, the closest prior art (Borden, Akram, Peng, Takekoshi), either singularly or in combination, fail to anticipate or render obvious wherein "calculating a goodness of fit value for a fitted curve between the effective lengths divided by the test

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measurement values and the effective widths of the resistive portions” in combination with all other limitations in the claims as defined by Applicant.

Claims 2-6, 30 and 33 depend from allowed claim 1 and therefore are also allowed.

Regarding claim 7, the closest prior art (Borden, Akram, Peng, Takekoshi), either singularly or in combination, fail to anticipate or render obvious wherein “calculating a goodness of fit value for fitted curve between (1) said effective lengths divided by the measured resistances ($L1/R1$, $L2/R2$,... Li/Ri); and (2) the effective widths ($W1$, $W2$,... Wi) of the resistive portions of the test structures” in combination with all other limitations in the claims as defined by Applicant.

Claims 8-10, 12-20 depend from allowed claim 7 and therefore are also allowed.

Regarding claim 21, the closest prior art (Borden, Akram, Peng, Takekoshi), either singularly or in combination, fail to anticipate or render obvious wherein “said effective length being substantially greater than said effective width, and said effective width being selected to be substantially greater than an expected critical dimension loss for said processes; calculating a goodness of fit value between the one divided by the sheet resistances ($1/Rs$) and a second parameter” in combination with all other limitations in the claims as defined by Applicant.

Claim 22 depends from allowed claim 22 and therefore is also allowed.

Regarding claim 23, the closest prior art (Borden, Akram, Peng, Takekoshi), either singularly or in combination, fail to anticipate or render obvious wherein “calculating a goodness of fit value for a fitted curve between the effective lengths divided by the test parameter values and the effective widths of the resistive portion” in combination with all other limitations in the claims as defined by Applicant.

Regarding claim 25, the closest prior art (Borden, Akram, Peng, Takekoshi), either singularly or in combination, fail to anticipate or render obvious wherein “wherein the first test structure is a resistance test structure that has a effective length and effective width, the first test measurement is a resistance test measurement; calculating a goodness of fit value for a fitted curve wherein the goodness of fit value is for a straight line fitted to the effective length divided by the resistance vs. the effective width; and wherein the test conditions have different temperatures” in combination with all other limitations in the claims as defined by Applicant.

Claim 26 depends from allowed claim 25 and therefore is also allowed.

Regarding claim 35, the closest prior art (Borden, Akram, Peng, Takekoshi), either singularly or in combination, fail to anticipate or render obvious wherein

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“determining a goodness of fit value based on the effective lengths divided by the test parameter values and the effective widths of the resistive portions” in combination with all other limitations in the claims as defined by Applicant.

Claims 36-40 depend from allowed claim 35 and therefore are also allowed.

Conclusion

5. Any comments considered necessary by applicant must be submitted no later than the payment of the issue fee and, to avoid processing delays, should preferably accompany the issue fee. Such submissions should be clearly labeled “Comments on Statement of Reasons for Allowance.”

Any inquiry concerning this communication or earlier communications from the examiner should be directed to PHUONG HUYNH whose telephone number is (571)272-2718. The examiner can normally be reached on M-F: 8:30 AM - 5:00 PM.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Eliseo Ramos-Feliciano can be reached on 571-272-7925. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

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Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

Phuong Huynh
Examiner
Art Unit 2857

/P. H./
Examiner, Art Unit 2857
November 18, 2008

/Eliseo Ramos-Feliciano/
Supervisory Patent Examiner, Art Unit 2857